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# DISABLING OPERATION OF A CAMERA ON A HANDHELD MOBILE COMMUNICATION DEVICE BASED UPON ENABLING OR DISABLING DEVICES

## FIELD

The present disclosure is directed toward a wireless handheld communication device, and more particularly, to controlling a camera module on the device with enablement and disablement devices

## BACKGROUND

With the advent of more robust wireless communications systems, compatible handheld communication devices are becoming more prevalent, as well as advanced. In a broader sense, these devices are referred to as handheld electronic devices, which include devices without communication functions. Where in the past such handheld communication devices typically accommodated either voice (cell phones) or text transmission (pagers and PDAs), today's consumer often demands a combination device capable of performing both types of transmissions, including sending and receiving e-mail. The suppliers of such mobile communication devices and underlying service providers are anxious to meet these demands, but the combination of voice and textual messaging, as well as other functionalities such as those found in PDAs, have caused designers to have to improve the means by which information is input into the devices by the user, as well as provide better facilitation for the user to navigate within the menus and icon presentations necessary for efficient user interface with these more complicated devices.

Due to recent advances in technology, digital camera components are now small enough to be placed inside handheld communication devices so that the devices are able to take and store digital pictures. The addition of a digital camera to these devices has proven to be quite popular among the general population. However, many corporations and governmental agencies are wary of small portable cameras, like those provided by these devices.

Camera lenses are commonly made of glass or plastic. They are used to direct beams of light onto the image sensor. The aperture, which is controlled automatically in most digital cameras, controls the amount of light that passes through the lens to the image sensor. The digital shutter regulates the image sensor's exposure to light. Specifically, the digital shutter simply turns off the image sensor, essentially serving to close the "shutter", and thus eliminating the need for the moving parts found in an analog camera. However, some digital cameras supplement a digital shutter with a mechanical shutter.

The focal length of a digital camera is determined by the image sensor's size and the distance from the lens to the subject to be photographed. As the image sensor gets smaller the focal length will also be reduced. Similarly, as the camera nears the subject to be photographed, the focal length will also be reduced. The focal length of the lens is usually adjustable to a limited extent. In digital cameras, the adjustability of the focal length is described as the optical zoom of the camera.

In a digital camera, the image sensor is typically either a CCD (charge-coupled device) or a CMOS (complimentary metal oxide semiconductor) sensor. Both of these sensors transform the light information into electrical signals.

The resolution of the images produced by the image sensor is defined in terms of pixels or megapixels, which is approxi-

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mately one million pixels. More pixels enable the camera to produce pictures of higher resolution. For a 4×6 picture, a two megapixel digital camera produces an image that is comparable to a standard 35 mm camera. Similarly for a 8×10 picture, a three megapixel digital camera produces an image that is comparable to a standard 35 mm camera.

The electric signals produced by the image sensor are sent to the microprocessor, where they are processed and configured to be stored in an electronic format. Picture formats include TIFF, JPEG, and other familiar types. The picture can then be saved to a fixed storage device inside the camera or a removable storage device associated with the camera. Examples of storage devices are on-board flash memory, compact flash memory cards, and secure digital (SD) cards. Picture files are normally compressed by software to increase available storage space.

The display for a digital camera is commonly a LCD (liquid crystal display). The display can be used to preview the "scene" before taking the photograph as well to show pictures stored on the camera or associated storage device. The display also normally facilitates user configuration of camera settings. Specifically, the user typically utilizes buttons or controls on the device housing to navigate the graphical user interface of the camera.

All of the components of a digital camera can be located within the housing of a handheld electronic device, thereby expanding the device's functionality to include photography. The pictures taken with these devices are generally stored onto a fixed memory within the device. Other devices make use of the removable memory options typically used to store pictures in digital cameras.

Portable cameras can be used to take pictures of confidential documents, classified research, prototypes, and other confidential subject matter. The pictures can then be stored on the device and subsequently transmitted wirelessly. Thus, confidential material can be improperly divulged and/or used for improper purposes. The ubiquitous presence of handheld communication devices in the business environment makes it difficult for businesses to control their use. The present disclosure is directed to a security system that can be utilized to disable certain features of the devices, such as an associated camera.

## BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary methods and arrangements conducted and configured according to the advantageous solutions presented herein are depicted in the accompanying drawings wherein:

FIG. 1a is an elevational view of a handheld communication device cradled in a user's hand;

FIG. 1b is an elevational rear view of a handheld communication device showing an integrated camera assembly;

FIG. 2 is block diagram of an exemplary communication system in which a handheld communication device may be used;

FIG. 3 is an exploded perspective view of an exemplary wireless handheld electronic device incorporating a trackball assembly;

FIG. 4 is a block diagram illustrating components of a host system in an exemplary configuration in connection with a communication network and handheld communication device;

FIG. 5 illustrates an exemplary QWERTY keyboard layout;

FIG. 6 illustrates an exemplary QWERTZ keyboard layout;

FIG. 7 illustrates an exemplary AZERTY keyboard layout;